

Fisher™ Vee-Ball™ Valve provides rotary control valve processing needs for Korean Oil Refining Company

RESULTS

- Cavitation protection on a rotary valve
- Helped customer in achieving OPEX savings up to 50% by avoiding major piping modification and using rotary valve with anti-cavitation trim instead of globe valve with anti-cavitation trim
- Aided in ensuring process continuity and plant's reliability



APPLICATION

Vacuum distillation unit in the plant in refining petroleum products.

CUSTOMER

A refinery company in South Korea.

CHALLENGE

Cavitation generally refers to the formation and collapse of vapor bubbles in control valves, when the fluid's pressure falls below its vapor pressure, which causes valve damage, noise and installed unit vibration occur.

The refinery's existing valve application is prone to cavitation, producing vibrations and noise. Process conditions also change to higher differential pressure, sometimes over five times, when cavitation occurs. It was also identified that the customer's current installation included an older model of spring-and-diaphragm actuator.

The process condition change on the NPS 8 Vee-Ball control valve was used for atmospheric residue flow control. Due to the higher process pressure drop, damaging cavitation can become a concern, leading to potential trim failure, vibration, and noise issues.

There were also fine particles present in the feed, that could potentially clog an anti-cavitation trim.

Moreover, the customer's concern on the major piping modification, pressure drop in the mild range and high flow rate requirements limited the flexibility of applying a globe valve anti-cavitation trim.

The project needed proven and customized solution to reduce safety hazards and increase overall plant production.



The customer is one of the most competitive energy companies in South Korea, aiming to increase their daily BSPD by revamping their base oil plant.

FISHER™

For more information:
www.Emerson.com/Fisher


EMERSON™

SOLUTION

Emerson's Local Business Partner in South Korea conducted a site walkdown and recommended installation of a Fisher Vee-Ball valve with Cavitrol Hex trim. The assembly combines the capacity and rangeability advantages of a segmented ball valve with a cavitation mitigation trim.

Cavitrol Hex trim is a single stage device that controls flow separation to ensure low pressure recovery. The hexagonal shape holes also offer more drag with sharp corners and more surface area with long flow passage which help slow the process flow to reduce cavitation.

Additive manufacturing technology, which helped overcome the manufacturing constraint due to the complexity of hexagonal shape design and offered the best delivery lead time to the customer.

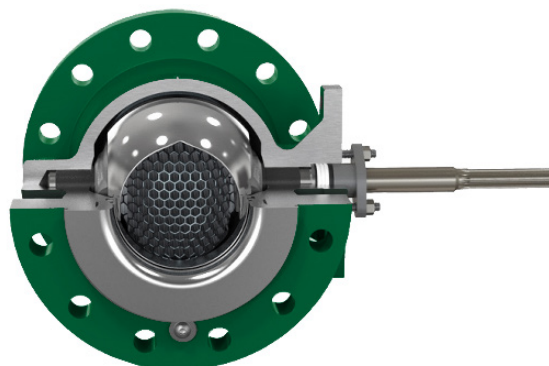
Cavitrol Hex trim with a harder cobalt chrome alloy material was incorporated into the solution consideration to handle the erosive fluids. Its hexagonal shape allows particle size up to 0.35-inch in diameter without concern of trim clogging. An extra 0.5-inch of face-to-face dimension was required to fulfill customer's expectation on minor piping modification at site.

The installed valve assembly has been operating since 2019 with field proven performance that address the customer's earlier concerns, especially on the regular valve maintenance and repair.

There is an opportunity to upgrade the existing standard V300 ball valve for Line B during the next turnaround scheduled in 2021.



Fisher Vee-Ball Cavitrol™ Hex Trim combines the advantages of Vee-Ball capacity and rangeability with Cavitrol Hex Trim that helps prevent cavitation.



The hexagonal shape holes also offer more drag with sharp corners and more surface area with long flow passage which help slow the process flow to reduce cavitation.

Emerson Automation Solutions

Marshalltown, Iowa 50158 USA
Sorocaba, 18087 Brazil
Cernay 68700 France
Dubai, United Arab Emirates
Singapore 128461 Singapore
www.Emerson.com

©Emerson 2021.

The Emerson logo is a trademark and service mark of Emerson Electric Co.

All rights reserved.

FISHER™

For more information:
www.Emerson.com/Fisher


EMERSON™